



## Modern Pedagogical Technologies in Teaching Biology

**Nazarova Furuza  
Axmedjanovna**

**Bukhara State University  
Department of Ecology and Geography  
Senior Teacher**

### ABSTRACT

This article discusses modern pedagogical technologies in teaching biology. At present, a new education system is being formed in Uzbekistan, focused on entering the world educational space. This process is accompanied by significant changes in the pedagogical theory and practice of the educational process.

### Keywords:

Biology, Pedagogical Technology, Innovation, Methodology, Interactive Methods, Natural Sciences, Ecology, Geography, Integration.

In our difficult time, such personality traits as purposefulness, activity, perseverance and the ability to achieve goals become vital. In addition to possessing these and other positive qualities, it is desirable to be able to think creatively, to be able to make non-standard decisions in difficult situations in any field of activity. Such people have always been valued and in demand. Modern psychologists, methodologists declare the need to form the abilities of schoolchildren, focusing on self-education, self-control in the process of socialization. The priority is the mastery of operational, intellectual general educational skills and not the acquisition of knowledge as such. The ability of students to transform, to carry out the transfer of knowledge in new conditions to a greater extent determine the meaning of the new concept of "competence", which appeared in the school with the beginning of modernization. The formation and development of a person competent in various activities is considered the goal of the educational process at school. Now in the education system, developing learning technologies are becoming a priority, designed

for continuous self-improvement of the personality of not only the student but also the teacher. Thinking, analyzing, comparing, highlighting the main thing, taking the initiative in obtaining knowledge, and at the same time providing moral education, ethical standards of behavior, tolerance is one of the areas of modern activity.

A rational and effective solution consists in the teacher's awareness of the priority of creative learning technologies, the end result of which is that students receive their own knowledge. In this case, research and project activities, gaming technologies, conferences, modular training, and the technology of a collective learning method are promising.

The ideal system of education, as we know, does not exist. Therefore, the most appropriate is the selection of a number of methods from different training systems and their application in certain combinations that complement each other and enrich the chosen training system. In this case, methods corresponding to the type of system on the basis of which the lesson is built with various didactic elements will prevail. The determining

role in the choice of the type of teaching system by the teacher is played by the nature of the material being studied. Also important is the level of students' competence (knowledge, skills, knowledge of the topic) and learning objectives, both general and characteristic of this period.

For both the student and the teacher, a lesson is interesting when it is up-to-date in the broadest sense of the word. Modern is completely new, but not losing touch with the past. If the lesson is modern, then it is sure to lay the foundation for the future.

When planning a lesson, the teacher needs to study and take into account:

- the originality of the topic, the degree of its study;
- the place and role of this topic in the course, education of civic qualities of the individual;
- the level of abilities of students in this class, their cognitive activity;
- selection of educational material;
- setting goals and objectives of the lesson;
- connection with previous material;
- form and type of lesson
- an optimal set of techniques and methods.

### **Modular technology in teaching biology.**

Modular learning as a pedagogical technology has become widespread in the practice of teaching biology. The essence of modular training is that the student completely independently achieves the specific goals of educational and cognitive activity in the process of working with the module.

A module is a target functional unit that combines educational content and technology for mastering it. The modular lesson differs from the usual one in that schoolchildren learn to work independently, communicate with each other, evaluate their work and that of their friend. Particular attention is paid to ensuring that each student understands the purpose of the lesson - what and how to study, what to focus on.

The role of the teacher in the modular lesson is to manage the work of students. With

such an organization of the lesson, it is possible to communicate with almost every student, help the weak and encourage the strong. No less important for the management of schoolchildren's learning is the principle of feedback, since no management is possible without control, analysis and correction, combined with self-management of the learning process by students. Therefore, the following types of control will be effective:

At the beginning of the lesson, the teacher conducts an input control of the knowledge and skills of students in order to have information about the levels of their readiness to work on new material.

Be sure to need current and intermediate control at the end of each training element.

After completion of the work on the module, an output control is carried out. It is effective to use testing to check the results of students' independent work, as it saves time and allows you to quickly control the work of students of the entire class. Testing can also be carried out as an input control. For students who work faster, it is necessary to have cards, the results of which are also checked and taken into account when marking.

When switching to modular education, the teacher's action system involves the development of a modular program, which consists of a comprehensive didactic goal and a set of modules that ensure the achievement of this goal.

To create such a program, the teacher must first of all:

- highlight the main scientific ideas of the course, for example: organism, biological system, ecological systems and others;
- structure the learning content around these ideas into specific blocks;
- formulate a comprehensive didactic goal;
- integrating didactic goals are singled out from the complex didactic goal and modules are formed;

Each integrating didactic goal is divided into particular didactic goals: On the basis of particular didactic goals, educational elements are distinguished. The introduction of modules into the educational process should be carried

out gradually. It is possible to combine a traditional system with a modular one, which enhances the quality and effectiveness of any training system.

Along with search and information skills, when working with modules, students form both educational and intellectual skills, and the skills to dialectically analyze the read text, compare, classify, establish causal relationships, see an analogy.

#### **Problem learning in biology lessons.**

It provides ample opportunities for the development of independent thinking, creative search of students. Thinking begins with the emergence of a problem, a question, a task that is successfully solved using a partially search, or heuristic method. Its essence lies in the fact that a small hint from the teacher reduces the search field, or the task is divided into subtasks and thus the problem persists, and the student's step-by-step movement towards the final solution is facilitated. The search method is the highest level of problem-based learning. It is characterized by the fact that students independently, without significant help from the teacher, discover and assimilate new knowledge and methods of action through the formulation of educational problems and their solution. This method is used in high school, when students already have a sufficient theoretical base and a certain level of worldview. In high school, the search method can be included in lessons conducted in the form of a seminar. Scheme of the problem seminar:

- Statement and understanding of the problem
- Generation of options for solving the problem (1-10)
- Selection of the most reasoned options (1-5)
- Selection of options, solutions that are most resistant to criticism (1-3)
- Discussion of implementation methods for selected solutions
- Summarizing

#### **Activities in problematic biology lessons.**

The whole class can work on a common task, or each group can have its own. The task

of the groups is to discuss and formulate their solution to the issue or problem. For example, it is necessary to find out the structural features of gymnosperms in the process of independent work with textbook material and studying the structure of a pine branch using handouts. To solve this issue, students recall the material on the external structure of the shoot, which was studied using the example of a branch. The group can immediately start discussing it, allowing everyone to speak in turn or first the question is decided in pairs and then all decisions are discussed by the group. A form of work is also possible in which each student in the group receives a separate task, becoming, as it were, an expert on some aspect of the topic being studied and then helping his group mates to master this material. This form is possible when studying the topic "Dependence of growth and development of plants on environmental conditions." At the final stage, all students in the class get acquainted with the results. The results of the work are evaluated individually, it is possible to evaluate the work of the whole group and then everyone receives the same marks. The composition of the group is selected so that it contains students of different levels of development and the degree of activity of work.

#### **Independent work with the textbook.**

Tasks when working with a textbook can be of a different nature: search-productive, comparative-analytical, creative, which allows a differentiated approach to teaching within the framework of a regular lesson.

In the lessons, elective courses in biology and after school hours, you can use electronic textbooks that help solve the following didactic tasks:

- acquire basic knowledge of the subject;
- systematize acquired knowledge;
- to form the skills of independent work with educational material using a computer;
- provide educational and methodological assistance to students in independent work on educational material;
- to provide a convenient educational environment and the possibility of independent

choice in the search for and use of information sources.

The most effective forms of presenting material in biology include multimedia presentations. This form allows you to present the educational material as a system of bright reference images. The purpose of such a presentation of educational information is the formation of a system of mental images in schoolchildren. The presentation of educational material in the form of a multimedia presentation reduces the time of learning, frees up the resources of children's health; allows you to build an educational process on the basis of psychologically correct modes of functioning of memory, attention, mental activity, humanization of the content of education. The use of multimedia presentations is advisable at any stage of the study of the topic and at any stage of the lesson.

New information technologies are being actively introduced into the research activities of students. Many schoolchildren are happy to carry out research and design work in biology and ecology, comparing tables, diagrams, drawings, diagrams. So, to protect some projects, the guys prepare slide films on their own.

Recently, there has been a massive introduction of the Internet in school education. The number of information resources in all subjects, including biology, is increasing. Visiting the Internet can be useful and effective in three main cases.

In addition to conducting lessons, the use of a computer in the educational process makes it possible to accumulate the necessary didactic material: options for control, examination, independent work.

When using information technology in your work, you must remember that more effective use in each lesson will be when we use not the entire lesson, but fragments of more complex questions. Using multimedia throughout the lesson is inefficient, it's easier and easier to use snippets or a specific question.

Computer lessons are also effective in the use of generalizing lessons, lessons - tests, as well as lessons - seminars, games.

The use of traditional lesson technologies in combination with computer technologies increases the efficiency of students, especially the feedback of error diagnostics increases when you can return to any question and repeat it again.

(Attached are presentations of lessons created by the teacher and students, as well as the website address on the Internet)

**Conclusion.** Currently, he sees the formation of a new education system, focused on entering the global educational space. This process is accompanied by significant changes in the pedagogical theory and practice of the educational process.

There is a change in the educational paradigm: different content, different approaches, different law, different attitudes, different behavior, different pedagogical mentality are offered.

The content of education is enriched with new procedural skills, the development of abilities to operate information, creative solutions to the problems of science and market practice with an emphasis on the individualization of educational programs.

Traditional methods of information - oral and written speech, telephone and radio communications are giving way to computer learning tools, the use of global telecommunications networks.

The most important component of the pedagogical process is the personality-oriented interaction of the teacher with the students.

A special role is given to the spiritual education of the individual, the formation of the moral character of a person.

Further integration of educational factors is planned: schools, families, micro- and macro-society.

The role of science in the creation of pedagogical technologies that are adequate to the level of social knowledge is increasing.

In psychological and pedagogical terms, the main trends in improving educational technologies are characterized by the transition:

- from learning as a function of memorization to learning as a process of

mental development that allows you to use what you have learned;

- from a purely associative, static model of knowledge to dynamically structured systems of mental actions;

- from focusing on the average student to differentiated and individualized training programs;

- from external motivation of teaching to internal moral-volitional regulation.

In education, the principle of variability has been proclaimed today, which makes it possible for teaching staff of educational institutions to choose and design the pedagogical process according to any model, including author's ones. The progress of education is also moving in this direction: the development of various options for its content, the use of modern didactics in increasing the effectiveness of educational structures; scientific development and practical justification of new ideas and technologies.

At the same time, it is important to organize a kind of dialogue between various pedagogical systems and teaching technologies, to test new forms in practice - additional and alternative to the state education system and to use integral pedagogical systems of the past in modern conditions.

Under these conditions, the teacher, leader (technologist of the educational process) needs to navigate a wide range of modern innovative technologies, ideas and not waste time discovering what is already known.

Today, it is impossible to be a pedagogically competent specialist without studying the entire vast arsenal of educational technologies.

## References

1. Konyushko V.S., Pavlyuchenko S.E., Chubarko S.V. Methods of teaching biology / V.S. Konyushko, S.E. Pavlyuchenko, S.V. Chubaro. Minsk: Book House, 2004.
2. Grichik V.V. Planning and conducting a biology lesson: Methodological recommendations for the course "Methods of teaching biology" / V.V. Grichik. Minsk: BGU, 1997.

3. Reader on the methodology of teaching biology. M., 1984.
4. Ahmadovich, T. N., Kosimovich, H. Y., Azamovna, J., & Ahmedjanovna, N. F. (2020). The Formation of Water Collector-Resources Drainage Network of Zarafshan Oasis and the Questions of Recycling. *TEST Engineering & Management*, 27380-2738.
5. Ф. Назарова. АНТРОПОГЕННОЕ ВОЗДЕЙСТВИЕ НА БИОСФЕРУ И ЕГО ПОСЛЕДСТВИЯ - ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu.uz), 2020
6. Назарова, Ф. А. (2020). ОЛИЙ ТАЪЛИМ ТИЗИМИДА ЭКОЛОГИЯ ДАРСЛАРИНИ ЎҚИТИШДА ИНТЕРФАОЛ УСЛУБЛАРДАН ФОЙДАЛАНИШ. *ГЕОГРАФИЯ: ПРИРОДА И ОБЩЕСТВО*, 1(2).